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ABSTRACT

The original Bayley Scales of Infant Development (BSID) have been among the most popular measures of performance and aptitude of infants. In this study, the construct validity of scores on the Behavior Rating Scale of the revised Bayley Scales, the BSID-II, was investigated using national standardization and clinical samples of children ranging in age from roughly 1 to 42 months, and a variety of factor analytic methods. In all, 2,106 children (562 1- to 5-month-old, 503 6- to 12-month-old, and 1,041 13- to 42-month-old subjects) provided data for the analyses. Results indicate that motor performance has an important influence on scores on the BSID-II Behavior Rating Scale, a result that is judged to be consistent with expectations. It is also clear that the structure underlying scale scores becomes increasingly more complex as the samples become more heterogeneous. The least heterogeneous samples are at the youngest age where development is least differentiated. These results offer insight into the integrity of scores from the new Bayley Scales. Seventeen tables present analysis details. (Contains 26 references.) (SLD)

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THE FACTOR STRUCTURE OF THE BEHAVIOR RATING SCALE OF THE BAYLEY SCALES OF INFANT DEVELOPMENT-II: CROSS-SAMPLE, CROSS-SECTIONAL, AND CROSS-METHOD INVESTIGATIONS OF CONSTRUCT VALIDITY

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ABSTRACT

The original *Bayley Scales of Infant Development* (BSID) (Bayley, 1969) have been among the most popular measures of performance and aptitude of infants. In this study we investigated the construct validity of scores on the Behavior Rating Scale of the revised *Bayley Scales*, the BSID-II. We employed national standardization samples of children ranging in age from roughly 1 to 42 months, and a variety of factor analytic methods.

The original *Bayley Scales of Infant Development* (BSID) (Bayley, 1969) have been among the most popular measures of performance and aptitude of infants. The initial publication of the BSID prompted a host of investigations regarding the characteristics of intelligence of infants ranging in age from roughly 1 to 42 months. Two parts of the original BSID--the mental scale and the motor scale--have been the primary focus of previous research efforts.

However, a third part of the measure--the Behavior Rating Scale (formerly labelled the Infant Behavior Record or IRB)--has also undergone considerably less clinical and experimental use. As noted by Matheny (1980, p. 1157) with respect to the Behavior Rating Scale, the scale is "considered by Bayley [and others] to provide useful information about infants' developmental status, but it has not received nearly as much attention" as the very thoroughly researched mental and motor scales. The IBR's most widely cited use has been in twins studies (e.g., Freedman, 1965; Goldsmith & Gottesman, 1981; Matheny, 1983), where it has been helpful in shedding important insights into the origins of aptitude and performance. Efforts to understand intelligence and behavior in infants is important to efforts to understand development more generally, and studies of development may ultimately have important implications for the ways we educate youngsters.

The revised Scales, the BSID-II, are currently being released, and the new BSID-II will doubtless spark at least as much research and attendant insight and controversy. The present study was conducted to explore the construct validity of scores from the new Behavior Rating Scale of the new BSID-II.

Our study was grounded on the philosophical premises that the business of science is formulating *generalizable* insight, and that no one study, taken singly, establishes the basis for such insight. As Neale and Liebert (1986, p. 290) observed:

> No one study, however shrewdly designed and carefully executed, can provide convincing support for a causal hypothesis or theoretical statement... Too many possible (if not plausible) confounds, limitations on generality, and alternative interpretations can be offered for any one observation. Moreover, each of the basic methods of research (experimental, correlational, and case study) and techniques of comparison (within- or between-subjects) has intrinsic limitations. How, then, does social science theory advance through research? The answer is, by collecting a diverse body of evidence about any major theoretical proposition.

In the context of the analytic methods that we employed--factor analyses--Gorsuch (1983, p. 201) made a related observation that, "Factors that will appear under a wide variety of conditions are obviously more desirable than factors that appear only under specialized conditions", e.g., only when certain samples or certain factor extraction or rotation methods are used.

Given our premises, we investigated the structure underlying BSID-II Behavior Rating Scale scores across (a) two different types of samples of subjects, (b) three different age groups of subjects within each sample type, and (c) using both first-order and second-order factor analyses and several factor rotation strategies. Specifically, with regard to sampling, we investigated structure using both BSID-II national standardization samples and samples consisting only of children with identified exceptionalities, and also using the combination of these two sample types. The three age cohorts we considered were: (a) children 1 to 5 months of age, (b) children 6 to 12 months of age, and (c) children 13 to 42 months of age. Different though overlapping items are used at each of these three ages.

Our study was conducted to address three research questions. First, what is the *first-order* factor structure underlying responses to BSID-II Behavior Rating Scale items across the two sample types and the combined sample across the three age groups? Second, what is the *second-order* factor structure underlying responses to BSID-II Behavior Rating Scale items across the two sample types and the combined sample across the three age groups? Third, do differences in mean factor scores across the two sample types also provide evidence of construct validity of BSID-II Behavior Rating Scale score?

Empirical Research with the Scale on the Original BSID

The structure underlying scores on the original BSID Behavior Rating Scale (formerly labelled the Infant Behavior Record) was investigated independent by various researchers (e.g., Wolf & Lozoff, 1985; Matheny, 1983; Matheny, Dolan & Wilson, 1974; Sameroff, Seifer & Zax, 1982; and Becker, Lederman & Lederman, 1989). Matheny's work was at the vanguard of these efforts. Based upon analysis of the items that had 5- or 9-point rating scales, Matheny (1983) proposed that three gender- and age-invariant factors underlay BSID Behavior Rating Scale items: (a) Task Orientation, (b) Test Affect-Extraversion, and (c) Activity. This three-factor solution was supported by results in several other studies (Braungart, Plomin, DeFries & Fulker, 1992; Plomin & DeFries, 1985; Kaplan, Jacobson & Jacobson, 1991).

Sameroff, Seifer and Zax (1982), however, extracted five factors in their research with children 4 and 12 months old, and six factors for children 30 months old. Although these factors appeared to overlap with those reported by Matheny, few details of their analyses were reported. Fried and Watkinson (1988) studied infants prenatally exposed to marijuana, cigarettes, and alcohol, and extracted factors similar to those obtained by Matheny. Kaplan, Jacobson and Jacobson (1991) analyzed data from continuously-scaled BSID Behavior Rating Scale items completed for low-income African American infants at ages 13 and 25 months. They extracted three factors--Test Affect, Test Attention, and Arousal--that closely resembled Matheny's (1980), notwithstanding some variation in the contribution of individual items to each factor.

Method

Sample

Test publishers are frequently willing to provide researchers with access to standardization sample data when they can be assured that the data will be treated as proprietary information, when thoughtful analytic proposals have accompanied requests for data access. We are grateful to the Psychological Corporation for providing us with access to BSID-II Behavior Rating Scale data for the purposes of the present study.

We were provided with access to national samples of data both for the standardization sample and for a clinical sample of children with diagnosed exceptionalities. Table 1 summarizes the demographic characteristics for the sample of 2,106 children who provided the data for our analyses.

INSERT TABLE 1 ABOUT HERE.

Results

Research Question #1

The study's first research question asked, what is the *first-order* factor structure underlying responses to BSID-II Behavior Rating Scale items across the two sample types and the combined sample across the three age groups? Many researchers acknowledge the prominent role that factor analysis can play in efforts to establish construct validity. For example, Nunnally (1978, p. 111) noted that, historically, "construct validity has been spoken of as [both] 'trait validity' and 'factorial validity.'"

Similarly, Gorsuch (1983, p. 350) noted that, "A prime use of factor analysis has been in the development of both the operational constructs for an area and the operational representatives for the theoretical constructs." In short, "factor analysis is intimately involved with questions of validity.... Factor analysis is at the heart of the measurement of psychological constructs" (Nunnally, 1978, pp. 112-113). We employed both first-order and second-order factor analysis in the present study. We employed principal components analyses for all factor extractions.

Analysts differ quite heatedly over the utility of principal components as compared to common or principal factor analysis. For example, an entire special issue on this controversy was recently published in *Multivariate Behavioral Research*. The difference between the two approaches involves the entries used on the diagonal of the correlation matrix that is analyzed--principal components analysis uses ones on the diagonal while common factor analysis uses estimates of reliability, usually estimated through an iterative process.

The two methods yield increasingly more equivalent results as either (a) the factored variables are more reliable or (b) the number of variables being factored is increased. Snook and Gorsuch (1989, p. 149) explain this second point, noting that "As the number of variables decreases, the ratio of diagonal to off-diagonal elements also decreases, and therefore the value of the communality has an increasing effect on the analysis." For example, with 10 variables the 10 diagonal entries in the correlation matrix represent 10% (10 / 100) of the 100 entries in the matrix, but with 100 variables the diagonal entries represent only 1% (100 / 10,000) of the 10,000 matrix entries. Gorsuch (1983) suggests that with 30 or more variables the differences between solutions from the two methods are likely to be small and lead to similar interpretations.

With respect to the 562 children *aged 1 to 5 months* in our study, based on application of Cattell's "scree" test to the eigenvalues (i.e., 5.90, 2.97, 1.40, 1.16, 0.94, etc.) prior to factor rotation (Thompson, 1989), we extracted two first-order factors for these data. We extracted the same number of factors in separate analyses for the standardization (_n_=387) and the clinical (_n_=175) samples. Because many items correlated with more than one factor, we rotated the first-order solution obliquely. We employed promax rotation for this purpose. As Gorsuch (1983, p. 191) notes, "because the procedure [promax rotation] gives good simple structure, is easily programmed, and is extremely fast, its popularity is spreading rapidly." Table 2 presents these results.

INSERT TABLE 2 ABOUT HERE.

With respect to the 503 children *aged 6 to 12 months*, based on application of Cattell's "scree" test to the eigenvalues (i.e., 8.55, 5.21, 1.66, 1.50, 1.31, etc.) prior to factor rotation (Thompson, 1989), we extracted three first-order factors for these data. We extracted the same numbers of factors in separate analyses for the standardization (_n_=315) and the clinical (_n_=188) samples. Because many items correlated with more than one factor, we again rotated the first-order solution to the promax criterion.

Table 3 presents these results.

INSERT TABLE 3 ABOUT HERE.

With respect to the 1,041 children *aged 13 to 42 months*, based on application of Cattell's "scree" test to the eigenvalues (i.e., 8.21, 4.83, 2.17, 1.80, 0.94, etc.) prior to factor rotation (Thompson, 1989), we extracted three first-order factors for these data. We extracted the same number of factors in separate analyses for the standardization (n=639) and the clinical (n=402) samples. Because many items correlated with more than one factor, we again rotated the first-order solution to the promax criterion. Table 4 presents these results.

INSERT TABLE 4 ABOUT HERE.

Research Question #2

We also investigated the structure underlying responses using second-order factor analysis. The study's second research question asked, what is the *second-order* factor structure underlying responses to BSID-II Behavior Rating Scale items across the two sample types and the combined sample across the three age groups?

Kerlinger (1984) noted that, "while ordinary factor analysis is probably well understood, second-order factor analysis, a vitally important part of the analysis, seems not to be widely known and understood" (p. xivv). Example applications of second-order factor analysis have been reported by Kerlinger (1984), Thompson and Borrello (1986), and by Thompson and Miller

(1981).

Gorsuch (1983) emphasizes that the extraction of correlated factors implies that second-order factors should be extracted. He noted, "Rotating obliquely in factor analysis implies that the factors do overlap and that there are, therefore, broader areas of generality than just a primary factor. Implicit in all oblique rotations are higher-order factors. It is recommended that these be extracted and examined..." (p. 255).

Thompson (1990, p. 575) explains second-order analysis:

> Many researchers are familiar with the extraction of principal components from either a variance-covariance matrix or a correlation matrix. However, the factors extracted from such matrices can be rotated obliquely such that the rotated factors themselves are correlated. This interfactor matrix can then, in turn, also be subjected to factor analysis. These 'higher order' factors would be termed second-order factors.

However, it is important not to try to interpret these second-order factors without first relating them back to the observed variables themselves. Interpreting second-order factors only with reference to the first-order factors has been likened to interpreting shadows (second-order factors) made by other shadows (first-order factors) caused by real objects (the actual variables).

Even some very sophisticated researchers incorrectly attempt to interpret the second-order factors using the first-order factors. For example, in his review of Kerlinger's (1984) second-order analyses, Thompson (1985) noted that

> It is particularly disturbing that the second-order factors are interpreted [by Kerlinger] in terms of the first-order factors. A number of strategies for relating the second-order structure back to the original items have been proposed and would have been appropriate. (p. 430)

As Gorsuch (1983) argued,

> Interpretations of the second-order factors would need to be based upon the interpretations of the first-order factors that are, in turn, based upon the interpretations of the variables... To avoid basing interpretations upon interpretations, the relationships of the original variables to each level of the higher-order factors are determined. (p. 245)

Gorsuch (1983, p. 247) suggested that one way to avoid "interpretations of interpretations" is to postmultiply the first-order factor pattern matrix times the orthogonally rotated second-order factor pattern matrix. However, if rotation is used to facilitate interpretation of other structures, it also seems plausible to rotate the product matrix itself to the varimax criterion.

For the purposes of the second-order analyses, we employed

Guttman's (1954) criterion, and extracted all first-order factors with eigenvalues greater than 1.0. These first-order factors were rotated to the promax criterion, the interfactor correlation matrix was analyzed and second-order factors were extracted and rotated to the varimax criterion. First-order factors were then post-multiplied by the second-order factors, as recommended by Gorsuch (1983), and the product matrix was then rotated to the varimax criterion. These analyses were conducted with program SECONDOR (Thompson, 1990). Tables 5 through 7 present these results for the three age groups and the various samples.

INSERT TABLES 5 THROUGH 7 ABOUT HERE.

There is another very intriguing way to interpret second-order factors that also avoids the interpretation of shadows of shadows of real objects. This is the solution proposed by Schmid and Leiman (1957), and explained by Gorsuch (1983, pp. 248-254). This solution "orthogonalizes" the two levels of analyses to each other and also allows interpretation of both levels of analysis in terms of the observed variables. Tables 8 through 10 present the Schmid-Leiman solutions, computed by program SECONDOR (Thompson, 1990), for the data from the children *aged 1 to 5 months*. It should be noted that the first two columns in Table 8, for example, are also equivalent to the unrotated product matrix that Gorsuch (1983, p. 247) suggested could be interpreted without rotation.

INSERT TABLES 8 THROUGH 10 ABOUT HERE.

Tables 11 through 13 present the Schmid-Leiman solutions for the data from the children *aged 6 to 12 months*. Tables 14 through 16 present the Schmid-Leiman solutions for the data from the children *aged 13 to 42 months*.

INSERT TABLES 11 THROUGH 16 ABOUT HERE.

Research Question #3

The study's third research question asked, do differences in mean factor scores across the two sample types also provide evidence of construct validity of BSID-II Behavior Rating Scale scores? To address this question, the varimax-rotated product matrices for the combined samples reported in Tables 2 through 4 were used to create factor scores for each of the three age groups. We then tested the mean differences across the standardization and the clinical samples across each factor for each of the three age groups. These results are reported in Table 17.

INSERT TABLE 17 ABOUT HERE.

Discussion

As Nunnally (1978, p. 298) noted, "one tends to take advantage of chance in any situation [all parametric methods] where something is optimized from the data at hand", as in least squares methods. And as Gorsuch (1983, p. 330) noted, "In factor analysis, one has numerous possibilities for capitalizing on chance." Thus, we were interested in detecting factor structure that was reasonably stable across samples and across analytic methods.

Three precepts guided our interpretation of these results. First, *we recognized that item or variable means do not directly affect factor structure.* Factors extracted from product-moment correlation coefficients, as in the present study, are "scale-free", i.e., item means do not directly impact results. This is because product-moment correlation coefficients are themselves scale-free. For example, the correlation coefficients between all three pairs of variables (X and Y, X and Z, Y and Z) are all +1.0, even though the means of the variables differ:

	X	Y	Z
Jon	1	1	3
Jane	2	2	4
Mike	3	3	5
$\overline{X}$	2	2	4

This meant that differences in items means across the two samples in a given age group might not *necessarily* create structure differences across the groups. That is, the structures might differ because relationships among variables differed, but differences in means *per se* do not yield such differences. If the only differences across samples are developmental delays, then structures will be comparable across groups.

Second, *we recognized that restriction of range or variability does attenuate product-moment correlation coefficients, which in turn impacts factor structure* (Dolenz, 1992). If subjects in a given sample generally score near the measurement "floor" or "ceiling", then the variability of scores on items will be smaller, and correlation coefficients among these scores will be attenuated. We expected some of these effects in our samples. For example, clinical subjects may have more homogeneous scores because of developmental delays. More importantly, the combined samples involving both the standardization and the clinical samples were by definition more heterogenous, and therefore their scores were more variable and the structure underlying these scores should theoretically be the most stable and generalizable.

Third, *we recognized that factor order within solutions and factor scaling directions were unimportant*. With respect to *order*, a given construct may emerge as Factor I in one sample, Factor II in another, and Factor III in yet a third sample. Small variations in the distribution of factor variance or trace (Thompson, 1989) are not noteworthy; what counts is whether the construct is reasonably stable regardless of ordering across solutions.

With respect to factor *scaling*, the direction in which a factor is scaled is generally arbitrary. For example, in one data set the variable "handsome" may have a structure coefficient on Factor I of +.9, while "ugly" has a structure coefficient of -.8. In a second sample the signs of the coefficients may be reversed. The construct still remains a measure of attractiveness. We can always legitimately "reflect" any factor by multiplying all the coefficients on the given factor by -1. This is legitimate because in the social science we do not presume any meaningful difference between abstract constructs scaled in different directions. For example, an achievement test can be scores number of right answers correct, or numbers of wrong answers. Thus, we did not attend to factor order or scaling direction differences in our interpretation.

Research Question #1

The study's first research question asked, what is the *first-order* factor structure underlying responses to BSID-II Behavior Rating Scale items across the two sample types and the combined sample across the three age groups? With respect to children *ages 1 to 5 months*, as suggested by the results reported in Table 2, a Motor Quality factor emerged as Factors I in all three analyses (standardization only, clinical only, and the combined sample). Factor II was reasonably similar across the three samples, and we named the factor, Attention. One noteworthy finding is that Factor I in the standardization sample was more of a "G" or "General" factor, as indicated by the structure coefficients reported in Table 2, and by the higher interfactor correlation coefficient between the factors for this sample. The factors did not emerge as identical constructs across samples, but do have identifiable commonalities.

With respect to the children *aged 6 to 12 months*, as suggested by the results reported in Table 3, a Motor Quality factor emerged as Factors III, I, and I in the three solutions respectively. A factor we labelled Orientation/Engagement emerged as Factors I, II, and II, respectively. A factor we labelled Emotional Regulation emerged as Factors II, III, and III, respectively. Again, the constructs emerge as related but not identical factors across the samples.

With respect to the children *aged 13 to 42 months*, as suggested by the results reported in Table 4, a Motor Quality factor emerged as Factors II, I, and II, respectively. A factor we labelled Orientation/Engagement emerged as Factor III in all three solutions. A factor we labelled Emotional Regulation emerged as Factors I, II, and I, respectively.

Research Question #2

The study's second research question asked, what is the *second-order* factor structure underlying responses to BSID-II Behavior Rating Scale items across the two sample types and the combined sample across the three age groups? We wanted to also analyze the data with second-order factor analysis, because various levels of analysis give different perspectives on data (Gorsuch, 1983, p. 240). As Thompson (1990, p. 579) explained, "The first-order analysis is a close-up view that focuses on the details of the valleys and the peaks in mountains. The second-order analysis is like looking at the mountains at a greater distance, and yields a potentially different perspective on the mountains as constituents of a range. Both perspectives may be useful in facilitating understanding of data."

Table 5 presented the varimax-rotated product matrix ($F_{18x4} \times F_{4x2} = F_{18x2}$) relating the two second-order factors for the children *aged 1 to 5 months* through the four first-order factors back to the original 18 variables used at this age level. In the clinical and the combined samples an Attention factor emerged as Factor I while a Motor Quality factor emerges as Factor II. However, for the standardization sample Factor I was a "G" factor. This result is consistent with the Table 2 first-order finding of a more saturated factor in this sample.

Table 6 presented the varimax-rotated product matrix for the children *aged 6 to 12 months*. The Motor Quality factor emerged as Factors II, III, and II, respectively. An Orientation/Engagement factor emerged as Factor I in the three solutions. The remaining factor (III, II and III, respectively) was basically uninterpretable in the standardization and clinical samples. However, in the more heterogenous combined sample (which also has the most subjects, i.e., 503), the factor appeared to measure Emotional Regulation.

Table 7 presented the varimax-rotated product matrix for the children *aged 13 to 42 months*. The Motor Quality factor emerged as Factors II, II, and I, respectively. An Orientation/Engagement factor emerged as Factors III, I, and II, respectively. Factor III for the clinical sample was not readily interpretable. An Emotional Regulation factor emerged as Factors I and III in the standardization and the combined samples, respectively.

The Schmid and Leiman (1957) solutions presented in Tables 8 through 16 provided yet another way to view the data. These solutions present the *unrotated* product matrices (as against the varimax-rotated product matrices presented in Tables 5 through 7) as the first several columns, followed by the first-order factors *with all variance present in the second-order product matrices* *removed from these first-order matrices.* Thus, the residualized first-order factors show what's left of the first-order factors, given the presence of the second-order factors. If the second-order factor perfectly reproduce the variance of a first-order factor, the residualized first-order factor will have a trace of 0.0.

The results presented in these tables are generally consistent with the interpretations presented earlier. However, Tables 8, 11, and 16 provide some interesting insights, and also illustrate the utility of the Schmid and Leiman (1957) solution. In these three tables the motor factor emerges as Factors I, II, and I, respectively. In all three tables, this factor accounts for the most trace (variance), i.e., 5.42, 5.24, and 5.93, respectively, and represents something of a "G" or "General" factor. In all three solutions, a related first-order factor appears as Factors A, B, and B, respectively.

The second-order Motor factor emerged as a more general activity factor, while the residualized and thus "orthogonalized" first-order factor more narrowly measures movement *per se*. One implication of these results is that movement saturates the factor space for the test and does so at several levels of analysis simultaneously.

<u>Research Question #3</u>

The study's third research question asked, do differences in mean factor scores across the two sample types also provide evidence of construct validity of BSID-II Behavior Rating Scale score? Table 17 presented the relevant results. These analyses evaluated differences in mean factor scores across the standardization as against the clinical samples. The varimax-rotated product matrices for the combined samples (presented in Tables 5 through 7) were used to compute these factor scores; these factors involved the most subjects and were most heterogenous, and therefore should yield the most generalizable scoring structures.

As reported in Table 17, statistically significant differences were noted only for Factors II, II, and I, respectively. As indicated in our interpretation of the combined samples results in Tables 5 through 7, these three factors are all the Motor Quality dimension. Thus, the two samples consistently differed on the average on this factor, but did not differ on other dimensions.

Summary

In a practical context, it is important to be able to measure abilities and behaviors of very young children, so that we may be able to identify those who may need and benefit from early intervention. In a scientific context, it is important to develop theory about the nature and the dynamics of aptitude and behavior as regards even very young children. Of course, deriving meaningful measurement of very young children is a daunting task.

Considerable effort has been invested in exploring the constructs measured by the Bayley Scales of Infant Development (BSID) since their development some 25 years ago (Bayley, 1969). The release of revised scales, BSID-II, may facilitate even greater insight regarding dynamics within young children. The present study focused on one scale from the BSID-II, the Behavior Rating Scale (formerly labelled the Infant Behavior Record on the original BSID). Two general conclusions emerge from our research.

First, it is clear that motor performance is an important influence on scores on the BSID-II Behavior Rating Scale. This dimension has particularly noteworthy influences on the factor structure underlying data on the scale. The factor emerges as a distinct entity across analyses. In some analyses (e.g. the standardization sample for children aged 1 to 5 months) the dimension tends to be a "G" factor that dominates the factor space. In several Schmid and Leiman (1957) solutions, motor dynamics emerge as strong influences at both first-order and second-order levels.

From a construct validity point of view, the question is whether this result is consistent with theoretical expectations. Given the nature of motor behavior and the item pools used on the scale at various age levels, we believe the result is consistent with expectations. Motor behavior is most easily discerned by the observer of very young children, and these behaviors seem conceptually discrete from the other items on the scale. It is also likely that motor quality mediates other aspects of performance on the Behavior Rating Scale. The remaining items on the scale are more abstract in their nature, and therefore the theoretical relationships among these items are less obvious.

Second, it is clear that the structure underlying scale scores becomes increasingly more complex as the samples become more heterogenous. The least heterogenous samples are at the youngest age, where developmental is least differentiated. And within the sample of children aged 1 to 5 months, the standardization sample is the most homogeneous. Thus, this sample at this age yields a two-dimensional structure in which one factor tends to be a "G" or "General" factor that is most highly correlated with the second factor, as reported in Tables 2, 5 and 8.

One expects more homogeneity in younger and less differentiated samples, and consequently expects less complex factor structure is expected here. One expects more heterogeneity in older more differentiated samples, and this expectation was confirmed. Thus, this result seems favorable with regard to construct validity.

Of course, no one study establishes the construct validity of scores from any measure. It will be important to replicate these results in other samples and across various analytic methods. However, results from relatively large national samples do offer important insights regarding the integrity of scores from the new Bayley Scales.

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Table 1

Sample Demographic Characteristics

Months of Age	Standardization		Clinical		Combined	
1-5	n=387		175		562	
	Female	48.8%	Female	50.0%	Female	49.1%
	Male	51.2%	Male	50.0%	Male	50.9%
	Major.	71.3%	Major.	78.3%	Major.	73.0%
	Nonmaj.	28.7%	Nonmaj.	21.7%	Nonmaj.	27.0%
6-12	n=315		188		503	
	Female	51.1%	Female	52.8%	Female	51.6%
	Male	48.9%	Male	47.2%	Male	48.4%
	Major.	72.7%	Major.	78.3%	Major.	74.3%
	Nonmaj.	27.3%	Nonmaj.	21.7%	Nonmaj.	25.7%
13-42	n=639		402		1041	
	Female	49.5%	Female	46.3%	Female	48.5%
	Male	50.5%	Male	53.7%	Male	51.5%
	Major.	70.6%	Major.	70.8%	Major.	70.6%
	Nonmaj.	29.4%	Nonmaj.	29.2%	Nonmaj.	29.4%

Note. "Major." is majority race, while "Nonmaj." is other.

Table 2

Promax-Rotated First-Order Structures for Ages 1 to 5 Months

Variable		Standardization (n=387) PATTERN MATRIX:			Clinical (n=175) PATTERN MATRIX:			Combined (n=562) PATTERN MATRIX:	
Predominant state	1	.22026	.89999	1	.00106	.53336	1	.07056	.62858
Lability of arousal	2	-.20786	-.87195	2	.82111	-.02442	2	.66909	-.13980
Positive affect	3	-.27532	.46758	3	.10615	.76724	3	.06770	.72739
Negative affect	4	-.17901	-.38981	4	.07937	-.20272	4	-.00053	-.24260
Soothability when upset	5	-.04656	.35698	5	-.09770	.25288	5	-.00729	.36699
Hypersensitivity to test...	6	.40021	-.13213	6	.85290	.01270	6	.78865	.01767
Energy	7	-.04858	.76495	7	-.04531	.71463	7	.00405	.72499
Adaptation to change of test...	8	-.40561	.20570	8	.04478	.64837	8	-.00539	.56256
Interest in test materials	9	-.18820	.62317	9	.01202	.82980	9	.06859	.80499
Exploration of objects...	10	-.34195	.39037	10	.10197	.71054	10	.04760	.67833
Orientation to examiner	11	-.26121	.54461	11	.01782	.72270	11	.02277	.73997
Gross-motor movement	12	-.68725	-.10420	12	-.25559	.43348	12	-.32285	.30497
Control of movement	13	-.68357	-.01070	13	-.05143	.47559	13	-.19004	.39843
Hypotonicity	14	.74844	.05806	14	.89167	.01951	14	.85592	.00760
Hypertonicity	15	.85339	.20107	15	.91998	.02458	15	.90571	.06073
Tremulousness	16	.45915	-.10404	16	.92157	.05397	16	.89476	.09883
Slow and delayed movement	17	.75480	-.03070	17	.83826	-.02299	17	.76511	-.11461
Frenetic movement	18	.72840	.13683	18	.91750	.04634	18	.91829	.10957

Standardization FACTOR r MATRIX:			Clinical FACTOR r MATRIX:			Combined FACTOR r MATRIX:		
1	1.00000	-.42358	1	1.00000	-.20528	1	1.00000	-.33138
2	-.42358	1.00000	2	-.20528	1.00000	2	-.33138	1.00000

Variable		Standardization STRUCTURE MATRIX:			Clinical STRUCTURE MATRIX:			Combined STRUCTURE MATRIX:	
Predominant state	1	-.16096	.80669	1	-.10842	.53314	1	-.13774	.60520
Lability of arousal	2	.16148	-.78390	2	.82613	-.19297	2	.71542	-.36152
Positive affect	3	-.47337	.58420	3	-.05135	.74545	3	-.17334	.70496
Negative affect	4	-.01390	-.31398	4	.12099	-.21902	4	.07987	-.24243
Soothability when upset	5	-.19777	.37670	5	-.14961	.27294	5	-.12891	.36941
Hypersensitivity to test...	6	.45618	-.30165	6	.85029	-.16238	6	.78279	-.24367
Energy	7	-.37260	.78553	7	-.19201	.72393	7	-.23619	.72365
Adaptation to change of test...	8	-.49274	.37751	8	-.08832	.63918	8	-.19181	.56434
Interest in test materials	9	-.45216	.70289	9	-.15832	.82733	9	-.19817	.78226
Exploration of objects...	10	-.50730	.53521	10	-.04389	.68961	10	-.17718	.66255
Orientation to examiner	11	-.49190	.65526	11	-.13053	.71904	11	-.22244	.73243
Gross-motor movement	12	-.64311	.18690	12	-.34458	.48595	12	-.42391	.41195
Control of movement	13	-.67904	.27884	13	-.14905	.48615	13	-.32207	.46141
Hypotonicity	14	.72385	-.25896	14	.88767	-.16353	14	.85340	-.27604
Hypertonicity	15	.76822	-.16041	15	.91493	-.16427	15	.88558	-.23940
Tremulousness	16	.50322	-.29853	16	.91049	-.13520	16	.86201	-.19767
Slow and delayed movement	17	.76780	-.35042	17	.84298	-.19507	17	.80309	-.36815
Frenetic movement	18	.67044	-.17170	18	.90799	-.14200	18	.88198	-.19473

Table 3

Promax-Rotated First-Order Structures for Ages 6 to 12 Months

Variable		Standardization (n=315) PATTERN MATRIX:			Clinical (n=188) PATTERN MATRIX:			Combined (n=503) PATTERN MATRIX:		
Predominant state	1	.58300	.02734	-.18537	-.06291	.48456	-.23222	-.10190	.51049	-.23647
Lability of arousal	2	-.54048	.00350	.18369	.89355	.04476	-.14171	.88619	-.05122	.03222
Positive affect	3	.49684	.04892	.10598	.03506	.48019	.16287	.06322	.44642	.16550
Negative affect	4	-.03470	.65695	.20120	-.00786	.23948	-.64904	-.01291	.20333	-.62093
Soothability when upset	5	.34367	-.12030	-.09857	-.29365	.11609	.17948	-.14968	.13713	.20620
Hypersensitivity to test...	6	-.11198	.53500	-.09592	.87791	.01793	-.12130	.81515	.01127	-.15022
Energy	7	.80831	.07486	.00305	.02367	.79075	.04773	.00111	.80055	-.02330
Adaptation to change of test...	8	.16962	-.56725	-.04399	.04971	-.19282	.71259	.06119	-.13642	.74133
Interest in test materials	9	.69163	-.06925	.08227	.04951	.74889	.10317	.03110	.73866	.08728
Initiative with tasks	10	.73156	.04632	.17063	-.09663	.78591	.05506	-.05633	.78627	.03833
Exploration of objects...	11	.07116	.83358	-.15242	.72076	.16214	.14037	.06058	.80177	-.10078
Attention to tasks	12	.43981	-.34146	.09867	.07421	.31280	.60077	.05593	.35954	.51334
Persistence in attempting...	13	.60129	-.20774	.08508	-.09085	.58450	.35461	-.05162	.57159	.31767
Enthusiasm toward tasks	14	.76006	-.10793	.07249	.05550	.63979	.30489	.03044	.71475	.21323
Fearfulness	15	-.38169	.24366	.02407	.82583	-.03346	-.09096	.76371	-.07444	-.08318
Frustration with inability...	16	.07580	.75364	.13775	.79389	-.02012	.08497	.67618	.13553	-.17915
Orientation to examiner	17	.25734	-.46361	.07538	-.09689	.17028	.50463	-.04548	.11008	.56969
Social engagement	18	.45814	-.04017	.08160	.14467	.47737	.20947	.13762	.43338	.21910
Cooperation	19	.24690	-.65808	.00437	-.01797	.08949	.75080	.02026	.06238	.77797
Gross-motor movement	20	.09471	.00462	.72037	-.01318	.21370	.50983	-.05239	.22389	.41070
Fine-motor movement	21	.14030	-.12530	.62905	-.02300	.12117	.68841	-.03393	.18955	.55048
Control of movement	22	.09332	-.02754	.67643	-.04350	.19990	.55461	-.03907	.22817	.41951
Hypotonicity	23	-.10538	-.15470	-.66446	.87904	.00373	-.04411	.87049	-.05276	.04395
Hypertonicity	24	.01819	.00571	-.64029	.84587	.04741	.07408	.85752	.01737	.09711
Tremulousness	25	.07799	.03928	-.53439	.94702	.04192	.03371	.94856	.02950	.09215
Slow and delayed movement	26	-.44132	-.19517	-.52235	.82190	-.20951	.17257	.76974	-.31360	.17947
Frenetic movement	27	.17248	.46585	-.48381	.93181	.06775	.01438	.90558	.07986	-.03506
Hyperactivity	28	.36527	.68276	-.23888	.88424	.04327	.02275	.84758	.16767	-.10020

FACTOR r MATRIX:

	Standardization			Clinical			Combined		
1	1.00000	-.33699	.28816	1.00000	-.14176	-.15380	1.00000	-.18106	-.23709
2	-.33699	1.00000	-.25315	-.14176	1.00000	.43795	-.18106	1.00000	.45421
3	.28816	-.25315	1.00000	-.15380	.43795	1.00000	-.23709	.45421	1.00000

STRUCTURE MATRIX:

Variable		Standardization			Clinical			Combined		
Predominant state	1	.52037	-.12220	-.02429	-.09589	.39177	-.01033	-.13827	.42153	.01956
Lability of arousal	2	-.48872	.13913	.02706	.90900	-.14397	-.25953	.88782	-.19704	-.20115
Positive affect	3	.51090	-.14534	.23677	-.05806	.54655	.36778	-.05685	.51015	.35328
Negative affect	4	-.19811	.61771	.02489	.05802	-.04366	-.54295	.09749	-.07636	-.52551
Soothability when upset	5	.35580	-.21116	.03092	-.33771	.23632	.27548	-.22340	.25789	.30398
Hypersensitivity to test...	6	-.31991	.59702	-.26362	.89402	-.15965	-.24847	.84873	-.20455	-.33837

Energy	7	.78396	-.19830	.21703	7	-.09577	.80830	.39040	7	-.13831	.78977	.34006
Adaptation to change of test...	8	.34810	-.61327	.14848	8	-.03255	.11221	.62050	8	-.08988	.18923	.66486
Interest in test materials	9	.73868	-.32315	.29911	9	-.07253	.78705	.42354	9	-.12334	.77267	.41541
Initiative with tasks	10	.76512	-.24340	.36971	10	-.21651	.82372	.41411	10	-.20779	.81388	.40882
Exploration of objects...	11	.70657	-.11628	.30702	11	-.02356	.75674	.20170	11	-.06070	.74503	.24904
Attention to tasks	12	.58331	-.51465	.31185	12	-.06253	.56539	.72634	12	-.13088	.58258	.66339
Persistence in attempting...	13	.69581	-.43190	.31094	13	-.22826	.75268	.62457	13	-.23043	.72523	.58954
Enthusiasm toward tasks	14	.81732	-.38241	.31883	14	-.08209	.76545	.57655	14	-.14953	.80609	.53066
Fearfulness	15	-.45687	.36619	-.14760	15	.84456	-.19037	-.23263	15	.79691	-.25050	-.29807
Frustration with inability...	16	-.13847	.69322	-.03119	16	.78367	-.09545	-.04594	16	.69412	-.06828	-.27791
Orientation to examiner	17	.43529	-.56941	.26690	17	-.19864	.40502	.59410	17	-.20048	.37708	.63047
Social engagement	18	.49519	-.21521	.22379	18	.04478	.54860	.39628	18	.00720	.50798	.38332
Cooperation	19	.46993	-.74239	.24211	19	-.14613	.42086	.79276	19	-.17549	.41207	.80150
Gross-motor movement	20	.30073	-.20965	.74649	20	-.12189	.43886	.60545	20	-.19030	.41992	.52481
Fine-motor movement	21	.36379	-.33182	.70120	21	-.14606	.42592	.74501	21	-.19877	.44573	.64462
Control of movement	22	.29753	-.23023	.71030	22	-.15715	.44897	.64885	22	-.17985	.42580	.53242
Hypotonicity	23	-.24472	.04902	-.65566	23	.88530	-.14021	-.17767	23	.86963	-.19042	-.18641
Hypertonicity	24	-.16824	.16166	-.63649	24	.82776	-.04006	-.03525	24	.83135	-.09379	-.09831
Tremulousness	25	-.08923	.14828	-.52185	25	.93590	-.07757	-.09359	25	.92137	-.10039	-.11935
Slow and delayed movement	26	-.52607	.08578	-.60012	26	.82506	-.25046	-.04560	26	.78397	-.37145	-.14547
Frenetic movement	27	-.12392	.53020	-.55204	27	.91999	-.05805	-.09926	27	.89943	-.10003	-.21349
Hyperactivity	28	.06635	.62014	-.30646	28	.87460	-.07212	-.09430	28	.84098	-.03131	-.22500

Table 4

Promax-Rotated First-Order Structures for **Ages 13 to 42 Months**

PATTERN MATRIX:

Variable		Standardization (n=639)			Clinical (n=402)			Combined (n=1041)		
Positive affect	1	.10843	.04464	**.65321**	-.19545	**.59608**	-.07008	**-.42393**	.00963	.27717
Negative affect	2	**-.70532**	-.17151	.02674	-.18633	**-.52059**	.16757	**.69307**	-.05460	.29550
Soothability when upset	3	**.53648**	.11543	.12400	-.15462	**.32684**	.15567	**-.46230**	-.18138	-.02192
Hypersensitivity to test...	4	**-.62947**	.17389	-.03026	**.83213**	.02261	-.05921	.18880	**.76249**	.00595
Energy	5	-.14326	-.11709	**.72772**	-.00708	.22289	**.46228**	-.10644	.07002	**.60609**
Adaptation to change of test...	6	**.76460**	.03022	.00181	.07382	**.68285**	-.18245	**-.76543**	-.00564	-.19291
Interest in test materials	7	**.38006**	-.04725	**.56355**	-.07983	**.71770**	.09316	**-.60043**	.01360	.32850
Initiative with tasks	8	**.30153**	-.10768	**.56927**	-.00282	**.53841**	**.50039**	**-.45793**	.01621	**.52493**
Exploration of objects...	9	-.12375	-.14239	**.73238**	-.01523	**.40280**	**.34817**	-.17660	.08779	**.62260**
Attention to tasks	10	**.71650**	-.01567	.17942	.06786	**.77499**	.07810	**-.76613**	.03162	.08022
Persistence in attempting...	11	**.62991**	.01210	**.31599**	.03981	**.69345**	.26652	**-.69519**	.01710	.21918
Enthusiasm toward tasks	12	**.53632**	.06108	**.53583**	.04887	**.86892**	.00068	**-.79025**	.08847	.18881
Fearfulness	13	-.04915	-.00160	**-.60006**	**.78453**	.04080	-.21133	.00312	**.71427**	-.21549
Frustration with inability...	14	**-.56431**	.08579	.05393	**.66266**	-.01400	-.11294	.22884	**.61581**	.05922
Orientation to examiner	15	**.55883**	.12890	**.44222**	.00857	**.85739**	-.24444	**-.80587**	.01604	-.04330
Social engagement	16	.07335	-.04289	**.64051**	-.21588	**.53036**	-.01719	**-.34332**	-.03204	**.36029**
Cooperation	17	**.76473**	.07824	.22218	.09546	**.86941**	-.07980	**-.87406**	.03653	-.04974
Gross-motor movement	18	.03792	**-.59624**	.10006	.09950	-.15290	**.92010**	.15825	-.01504	**.74433**
Fine-motor movement	19	.11569	**-.64180**	.09433	.05516	-.04652	**.88847**	.06297	-.05155	**.72185**
Control of movement	20	.06792	**-.69080**	.03640	-.03209	-.05096	**.86073**	.11316	-.15257	**.68843**
Hypotonicity	21	.12820	**.76119**	-.02348	**.94126**	-.00153	.06016	-.11024	**.93139**	-.02515
Hypertonicity	22	.04745	**.75691**	-.00151	**.91975**	-.05009	.16665	-.06549	**.90559**	.03475
Tremulousness	23	.05369	**.54144**	.01562	**.90960**	.07919	-.06754	-.15045	**.92358**	-.05957
Slow and delayed movement	24	.11295	**.63166**	-.29807	**.92473**	.01571	.18348	-.09459	**.85473**	-.05150
Frenetic movement	25	**-.46369**	**.49736**	.19217	**.92626**	.06251	.03539	-.01271	**.90347**	.02005
Hyperactivity	26	**-.71785**	.24281	**.41289**	**.75698**	-.01595	-.03100	.17717	**.72058**	.11290

FACTOR r MATRIX:

	Standardization (n=639)			Clinical (n=402)			Combined (n=1041)		
1	1.00000	-.22303	.29297	1.00000	-.15108	-.28057	1.00000	.20159	-.33076
2	-.22303	1.00000	-.19613	-.15108	1.00000	.28187	.20159	1.00000	-.28246
3	.29297	-.19613	1.00000	-.28057	.28187	1.00000	-.33076	-.28246	1.00000

STRUCTURE MATRIX:

Variable		Standardization (n=639)			Clinical (n=402)			Combined (n=1041)		
Positive affect.	1	.28985	-.10766	**.67622**	-.26585	**.60586**	.15278	**-.51366**	-.15412	**.41466**
Negative affect	2	**-.65923**	-.01945	-.14626	-.15470	**-.44520**	.07311	**.58432**	.00165	.08168
Soothability when upset	3	**.54706**	-.02854	.25854	-.24768	**.39408**	.29118	**-.49161**	-.26838	.18222
Hypersensitivity to test...	4	**-.67712**	**.32022**	-.24878	**.84533**	-.11980	-.28631	**.34055**	**.79887**	-.27187
Energy	5	.09606	-.22787	**.70872**	-.17046	**.35426**	**.52709**	-.29279	-.12264	**.62152**
Adaptation to change of test...	6	**.75839**	-.14066	.21989	.02184	**.62027**	-.01069	**-.70276**	-.10546	.06186
Interest in test materials	7	**.55570**	-.24254	**.68416**	-.21440	**.75602**	.31786	**-.70634**	-.20023	**.52325**
Initiative with tasks	8	**.49232**	-.28658	**.67873**	-.22456	**.67988**	**.65294**	**-.62829**	-.22437	**.67182**

Exploration of objects...	9	.12257	-.25843	.72405	9	-.17377	.50324	.46598	9	-.36483	-.12367	.65622
Attention to tasks	10	.77256	-.21066	.39240	10	-.07114	.78675	.27751	10	-.78629	-.14549	.32469
Persistence in attempting...	11	.71978	-.19037	.49816	11	-.13974	.76256	.45081	11	-.76424	-.18495	.44429
Enthusiasm toward tasks	12	.67968	-.16363	.68098	12	-.08260	.86173	.23190	12	-.83487	-.12417	.42520
Fearfulness	13	-.22459	.12706	-.61415	13	.83766	-.13730	-.41995	13	.21839	.77576	-.41827
Frustration with inability...	14	-.56764	.20107	-.12822	14	.69646	-.14595	-.30281	14	.33339	.64521	-.19041
Orientation to examiner	15	.65964	-.08247	.58066	15	-.05239	.78719	-.00517	15	-.78831	-.13419	.21872
Social engagement	16	.27056	-.18488	.67041	16	-.29119	.55813	.19288	16	-.46895	-.20302	.48290
Cooperation	17	.81237	-.13589	.43088	17	-.01350	.83249	.13848	17	-.85024	-.12562	.22905
Gross-motor movement	18	.20021	-.62432	.22811	18	-.13555	.09142	.84909	18	-.09098	-.19338	.69624
Fine-motor movement	19	.28646	-.68611	.25410	19	-.18708	.19558	.85988	19	-.18618	-.24274	.71558
Control of movement	20	.23266	-.71309	.19179	20	-.26589	.19650	.85537	20	-.14530	-.32421	.69410
Hypotonicity	21	-.04845	.73720	-.13521	21	.92462	-.12679	-.20436	21	.08584	.91627	-.25176
Hypertonicity	22	-.12181	.74663	-.13607	22	.88056	-.14207	-.10552	22	.10558	.88257	-.19938
Tremulousness	23	-.06249	.52640	-.07484	23	.91658	-.07728	-.30042	23	.05545	.91008	-.27068
Slow and delayed movement	24	-.11525	.66493	-.38887	24	.87088	-.07228	-.07154	24	.09476	.85021	-.26164
Frenetic movement	25	-.51831	.56308	-.04122	25	.90688	-.06746	-.20686	25	.16279	.89525	-.23094
Hyperactivity	26	-.65104	.32193	.15495	26	.76809	-.13906	-.24788	26	.28510	.72441	-.14924

Table 5
Varimax-Rotated Product ($F_{VxF} \times F_{FxS} = F_{VxS}$) Matrices and h^2 for **Ages 1 to 5 Months**

Standardization (n=387) Variable	I	II	h^2	Clinical (n=175) Variable	I	II	h^2	Combined (n=562) Variable	I	II	h^2
1 Predom State	**.542**	-.205	.336	1 Predom State	**.569**	.001	.324	1 Predom State	.606	-.027	.368
2 Labil Arousa	**-.518**	.223	.318	2 Labil Arousa	-.059	**.826**	.685	2 Labil Arousa	-.208	**.645**	.460
3 Posit Affect	**.632**	-.144	.420	3 Posit Affect	**.692**	-.037	.481	3 Posit Affect	**.659**	-.148	.457
4 Negat Affect	.178	**.800**	.672	4 Negat Affect	**-.426**	-.039	.183	4 Negat Affect	**-.416**	-.066	.178
5 Soothability	.165	**-.462**	.241	5 Soothability	**.313**	-.070	.103	5 Soothability	**.465**	-.038	.217
6 Hypersensiti	-.233	**.557**	.365	6 Hypersensiti	-.029	**.854**	.730	6 Hypersensiti	-.093	**.750**	.570
7 Energy	**.658**	-.221	.481	7 Energy	**.630**	-.189	.432	7 Energy	**.643**	-.180	.447
8 Adapt Change	**.355**	**-.462**	.339	8 Adapt Change	**.706**	-.026	.499	8 Adapt Change	**.582**	-.151	.361
9 Interest Tes	**.643**	-.252	.477	9 Interest Tes	**.780**	-.145	.629	9 Interest Tes	**.731**	-.157	.560
10 Explor Objec	**.654**	-.067	.433	10 Explor Objec	**.579**	-.100	.346	10 Explor Objec	**.547**	-.206	.342
11 Orient Exami	**.526**	**-.489**	.515	11 Orient Exami	**.800**	-.029	.640	11 Orient Exami	**.759**	-.138	.595
12 Gross-motor	**.484**	-.116	.248	12 Gross-motor	**.324**	**-.443**	.301	12 Gross-motor	.237	**-.492**	.299
13 Control Move	**.544**	-.163	.323	13 Control Move	**.315**	-.273	.174	13 Control Move	**.303**	**-.396**	.249
14 Hypotonicity	**-.612**	.058	.378	14 Hypotonicity	-.075	**.845**	.720	14 Hypotonicity	-.089	**.834**	.703
15 Hypertonicit	**-.574**	.054	.333	15 Hypertonicit	-.080	**.871**	.764	15 Hypertonicit	-.047	**.871**	.760
16 Tremulousnes	**-.433**	.179	.220	16 Tremulousnes	-.001	**.909**	.826	16 Tremulousnes	.002	**.840**	.706
17 Slow Delayed	**-.673**	.111	.465	17 Slow Delayed	-.135	**.781**	.628	17 Slow Delayed	-.186	**.785**	.652
18 Frenetic Mov	**-.439**	.218	.240	18 Frenetic Mov	-.060	**.874**	.767	18 Frenetic Mov	-.014	**.860**	.740
Trace	4.82	1.98	6.80	Trace	3.80	5.43	9.23	Trace	3.60	5.06	8.66

40

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Table 6

Varimax-Rotated Product (F_{VxF} x F_{FxS} = F_{VxS}) Matrices and h^2 for **Ages 6 to 12 Months**

Standardization (n=315) Variable	I	II	III	h^2
1 Predom State	.128	.079	**-.889**	.813
2 Labil arousa	-.063	-.126	**.874**	.783
3 Posit Affect	**.690**	.108	.058	.491
4 Negat Affect	-.197	-.193	.167	.104
5 Soothability	**.489**	.009	-.067	.243
6 Hypersensiti	-.177	**-.536**	.156	.343
7 Energy	**.569**	.147	**-.444**	.543
8 Adapt Change	**.301**	**.428**	.035	.275
9 Interest Tes	**.469**	**.393**	-.282	.453
10 Initiative	**.522**	**.341**	-.240	.447
11 Exploration	**.556**	.200	-.206	.392
12 Atten Tasks	.305	**.566**	-.091	.421
13 Persistence	**.440**	**.464**	-.164	.436
14 Enthusiasm	**.594**	**.364**	-.288	.569
15 Fearfulness	**-.645**	.059	.173	.450
16 Frus Inabili	-.142	**-.337**	.066	.138
17 Orient Exami	**.619**	.185	.004	.417
18 Soc Engageme	**.659**	.183	.121	.482
19 Cooperation	**.463**	**.525**	.074	.495
20 Gross-motor	.254	**.548**	-.035	.366
21 Fine-motor	.278	**.633**	.069	.482
22 Control Move	.130	**.639**	-.035	.427
23 Hypotonicity	-.292	-.261	.110	.166
24 Hypertonicit	-.181	**-.357**	.149	.182
25 Tremulousnes	.025	**-.452**	.122	.220
26 Slow Delayed	**-.400**	**-.348**	.219	.329
27 Frenetic Mov	-.027	**-.638**	.066	.413
28 Hyperactivit	.165	**-.578**	.047	.363
Trace	4.60	4.37	2.28	11.24

Clinical (n=188) Variable	I	II	III	h^2
1 Predom State	.260	**.721**	-.119	.602
2 Labil arousa	-.144	.133	**.897**	.843
3 Posit Affect	**.587**	.090	.010	.353
4 Negat Affect	**-.304**	.432	.038	.281
5 Soothability	.217	**-.385**	**-.301**	.286
6 Hypersensiti	-.150	.061	**.888**	.815
7 Energy	**.660**	.129	-.054	.456
8 Adapt Change	**.471**	-.204	.006	.263
9 Interest Tes	**.643**	-.016	-.030	.414
10 Initiative	**.629**	-.055	-.175	.429
11 Exploration	**.522**	.175	.013	.304
12 Atten Tasks	**.704**	-.267	-.021	.567
13 Persistence	**.727**	-.165	-.182	.589
14 Enthusiasm	**.725**	-.075	-.038	.533
15 Fearfulness	-.217	-.171	**.834**	.772
16 Frus Inabili	-.043	-.196	**.787**	.659
17 Orient Exami	**.659**	.096	-.140	.464
18 Soc Engageme	**.609**	.083	.110	.389
19 Cooperation	**.696**	-.290	-.095	.578
20 Gross-motor	**.679**	.086	-.074	.474
21 Fine-motor	**.699**	-.214	-.095	.543
22 Control Move	**.676**	-.089	-.104	.476
23 Hypotonicity	-.088	.040	**.884**	.792
24 Hypertonicit	.070	.160	**.827**	.714
25 Tremulousnes	.004	.087	**.935**	.882
26 Slow Delayed	-.072	-.097	**.827**	.698
27 Frenetic Mov	.015	.122	**.918**	.859
28 Hyperactivit	-.032	.020	**.865**	.750
Trace	6.65	1.37	7.77	15.78

Combined (n=503) Variable	I	II	III	h^2
1 Predom State	.090	-.116	.182	.055
2 Labil arousa	-.116	**.870**	-.050	.774
3 Posit Affect	.086	.007	**.808**	.660
4 Negat Affect	**-.418**	.133	.062	.196
5 Soothability	.078	-.216	**.419**	.228
6 Hypersensiti	-.235	**.828**	-.051	.743
7 Energy	.337	-.071	**.540**	.410
8 Adapt Change	**.522**	-.081	.124	.294
9 Interest Tes	**.445**	-.042	**.478**	.428
10 Initiative	**.459**	-.115	**.480**	.454
11 Exploration	.265	.022	**.563**	.388
12 Atten Tasks	**.714**	-.063	.186	.548
13 Persistence	**.627**	-.146	**.348**	.536
14 Enthusiasm	**.533**	-.071	**.493**	.532
15 Fearfulness	-.130	**.777**	-.218	.669
16 Frus Inabili	-.121	**.707**	-.031	.515
17 Orient Exami	**.437**	-.152	**.418**	.389
18 Soc Engageme	.129	.074	**.792**	.649
19 Cooperation	**.650**	-.133	.296	.528
20 Gross-motor	**.623**	-.041	.211	.434
21 Fine-motor	**.743**	-.056	.166	.583
22 Control Move	**.661**	-.034	.154	.462
23 Hypotonicity	-.096	**.847**	-.074	.733
24 Hypertonicit	.027	**.832**	-.059	.697
25 Tremulousnes	-.031	**.906**	-.008	.822
26 Slow Delayed	-.073	**.746**	-.239	.619
27 Frenetic Mov	-.097	**.890**	-.012	.802
28 Hyperactivit	-.115	**.828**	.030	.700
Trace	4.39	7.00	3.45	14.85

Table 7

Varimax-Rotated Product ($F_{VxF} \times F_{FxS} = F_{VxS}$) Matrices and h^2 for **Ages 13 to 42 Months**

Standardization (n=387)

Variable	I	II	III	h^2
1 Posit Affect	.188	-.028	**.657**	.468
2 Negat Affect	**-.666**	-.083	-.077	.456
3 Soothability	**.536**	.036	.208	.332
4 Hypersensiti	**-.652**	.232	-.148	.501
5 Energy	-.026	-.178	**.712**	.540
6 Adapt Change	**.744**	-.051	.119	.571
7 Interest Tes	**.437**	-.146	**.612**	.587
8 Initiative	**.365**	-.198	**.608**	.542
9 Exploration	-.016	-.205	**.713**	.551
10 Atten Tasks	**.716**	-.104	.281	.603
11 Persistence	**.640**	-.087	**.399**	.577
12 Enthusiasm	**.575**	-.053	**.601**	.695
13 Fearfulness	-.135	.070	**-.610**	.396
14 Frus Inabili	**-.565**	.148	-.055	.345
15 Orient Exami	**.586**	.014	**.516**	.611
16 Soc Engageme	.178	-.092	**.649**	.462
17 Cooperation	**.762**	-.028	**.330**	.691
18 Gross-motor	.160	**-.551**	.159	.354
19 Fine-motor	.230	**-.610**	.166	.453
20 Control Move	.172	**-.671**	.110	.492
21 Hypotonicity	.071	**.784**	-.062	.624
22 Hypertonicit	.000	**.791**	-.052	.628
23 Tremulousnes	.019	**.565**	-.021	.320
24 Slow Delayed	-.018	**.626**	-.334	.504
25 Frenetic Mov	**-.501**	**.507**	.070	.513
26 Hyperactivit	**-.676**	.263	.279	.605
Trace	5.44	3.66	4.32	13.42

Clinical (n=175)

Variable	I	II	III	h^2
1 Posit Affect	**.648**	-.273	-.113	.507
2 Negat Affect	**-.378**	**-.311**	-.034	.240
3 Soothability	**.338**	-.152	.252	.200
4 Hypersensiti	-.031	**.780**	-.191	.646
5 Energy	**.402**	-.219	.296	.297
6 Adapt Change	**.559**	.179	.015	.345
7 Interest Tes	**.765**	-.160	.098	.620
8 Initiative	**.658**	-.150	**.483**	.689
9 Exploration	**.566**	-.223	.184	.404
10 Atten Tasks	**.742**	.069	.200	.595
11 Persistence	**.720**	-.015	.345	.637
12 Enthusiasm	**.860**	.010	.057	.743
13 Fearfulness	-.073	**.806**	-.268	.727
14 Frus Inabili	-.045	**.602**	-.267	.436
15 Orient Exami	**.777**	.051	-.130	.624
16 Soc Engageme	**.620**	-.333	-.113	.508
17 Cooperation	**.792**	.135	.070	.650
18 Gross-motor	.032	-.080	**.864**	.755
19 Fine-motor	.120	-.101	**.875**	.789
20 Control Move	.126	-.193	**.837**	.754
21 Hypotonicity	-.070	**.903**	-.029	.822
22 Hypertonicit	-.097	**.867**	.078	.767
23 Tremulousnes	-.014	**.895**	-.142	.821
24 Slow Delayed	-.036	**.876**	.113	.781
25 Frenetic Mov	.003	**.874**	-.072	.769
26 Hyperactivit	-.058	**.703**	-.159	.523
Trace	5.97	6.58	3.10	15.65

Combined (n=562)

Variable	I	II	III	h^2
1 Posit Affect	-.031	**.571**	-.315	.426
2 Negat Affect	.020	.119	**.686**	.485
3 Soothability	.236	.093	**-.476**	.291
4 Hypersensiti	**-.726**	-.017	.290	.611
5 Energy	.077	**.703**	-.029	.501
6 Adapt Change	.072	.008	**-.756**	.576
7 Interest Tes	.104	**.574**	**-.524**	.615
8 Initiative	.235	**.635**	**-.417**	.632
9 Exploration	.054	**.762**	-.084	.591
10 Atten Tasks	.128	.277	**-.738**	.637
11 Persistence	.172	.398	**-.662**	.626
12 Enthusiasm	.011	**.499**	**-.701**	.740
13 Fearfulness	**-.669**	-.244	.067	.512
14 Frus Inabili	**-.619**	.059	.328	.495
15 Orient Exami	-.035	**.312**	**-.720**	.618
16 Soc Engageme	.033	**.618**	-.243	.442
17 Cooperation	.049	.228	**-.826**	.737
18 Gross-motor	**.516**	**.399**	.062	.429
19 Fine-motor	**.553**	**.405**	-.035	.472
20 Control Move	**.598**	**.384**	.011	.506
21 Hypotonicity	**-.769**	-.037	-.011	.593
22 Hypertonicit	**-.705**	-.020	.019	.498
23 Tremulousnes	**-.796**	-.031	-.040	.636
24 Slow Delayed	**-.683**	-.098	-.020	.476
25 Frenetic Mov	**-.798**	.035	.106	.649
26 Hyperactivit	**-.700**	.139	.300	.599
Trace	5.79	3.74	4.86	14.39

Table 8
Schmid and Leiman (1957) Solution for
Standardization (n=387) Sample for **Ages 1 to 5 Months**

Variable	I	II	A	B	C	D	h^2
1 Predom State	**.576**	-.063	.057	**.660**	.056	-.005	.778
2 Labil Arousa	**-.557**	.086	-.021	**-.672**	.000	.010	.770
3 Posit Affect	**.648**	.018	.023	.082	**.455**	.023	.634
4 Negat Affect	-.027	**.819**	-.070	-.096	.021	.101	.696
5 Soothability	.276	**-.406**	.134	-.068	**.350**	-.034	.387
6 Hypersensiti	**-.365**	**.481**	.185	.089	-.138	.053	.429
7 Energy	**.692**	-.049	-.064	**.533**	.116	-.001	.783
8 Adapt Change	**.459**	**-.359**	-.098	-.124	**.317**	-.030	.466
9 Interest Tes	**.686**	-.083	-.016	.271	**.322**	.004	.654
10 Explor Objec	**.650**	.099	-.100	.157	**.303**	.026	.559
11 Orient Exami	**.631**	**-.342**	-.049	.145	**.318**	-.028	.640
12 Gross-motor	**.497**	.009	**-.366**	-.106	.113	.006	.405
13 Control Move	**.568**	-.021	**-.422**	.021	.031	-.001	.502
14 Hypotonicity	**-.607**	-.098	**.367**	.096	-.192	-.021	.560
15 Hypertonicit	**-.569**	-.091	**.508**	.090	-.032	-.013	.601
16 Tremulousnes	**-.464**	.065	**.399**	-.219	.155	.015	.450
17 Slow Delayed	**-.679**	-.061	**.471**	-.078	-.038	-.009	.695
18 Frenetic Mov	**-.479**	.101	**.516**	-.004	.113	.017	.519
Trace	5.42	1.38	1.44	1.42	.85	.02	10.53

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 2 columns represent the second order factors. The next 4 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 9
Schmid and Leiman (1957) Solution for
Clinical (n=175) Sample for **Ages 1 to 5 Months**

Variable	I	II	A	B	C	D	h^2
1 Predom State	**.569**	.004	-.011	**.519**	-.215	.020	.640
2 Labil Arousa	-.064	**.825**	.202	-.040	-.072	-.077	.739
3 Posit Affect	**.693**	-.033	.022	**.368**	.233	.017	.671
4 Negat Affect	**-.426**	-.042	.017	.074	.158	**.575**	.544
5 Soothability	**.314**	-.068	-.030	.242	-.151	-.064	.189
6 Hypersensiti	-.034	**.854**	.208	.013	-.093	-.051	.785
7 Energy	**.631**	-.186	-.016	**.393**	.221	.102	.647
8 Adapt Change	**.706**	-.022	.016	.024	.276	**-.407**	.741
9 Interest Tes	**.781**	-.141	.004	.237	**.370**	-.132	.840
10 Explor Objec	**.580**	-.097	.027	.175	**.472**	.030	.601
11 Orient Exami	**.800**	-.025	.004	.195	.134	**-.364**	.829
12 Gross-motor	**.327**	**-.441**	-.054	-.113	**.599**	-.016	.676
13 Control Move	**.317**	-.271	-.004	-.084	**.645**	.053	.600
14 Hypotonicity	-.080	**.845**	.220	-.045	.045	.006	.773
15 Hypertonicit	-.085	**.870**	.226	-.012	.028	.041	.818
16 Tremulousnes	-.006	**.909**	.225	.024	-.068	-.048	.885
17 Slow Delayed	-.139	**.780**	.208	-.069	.080	.055	.685
18 Frenetic Mov	-.065	**.873**	.223	.068	-.030	.087	.830
Trace	3.81	5.42	.33	.78	1.45	.69	12.49

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 2 columns represent the second order factors. The next 4 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 10
Schmid and Leiman (1957) Solution for
Combined (n=562) Sample for **Ages 1 to 5 Months**

Variable	I	II	A	B	C	D	h^2
1 Predom State	**.607**	-.005	-.002	**.585**	-.113	-.039	.724
2 Labil Arousa	-.231	**.637**	.178	**-.342**	.134	-.057	.630
3 Posit Affect	**.664**	-.123	.021	.209	.319	-.097	.612
4 Negat Affect	**-.414**	-.082	.017	.006	.227	**.497**	.477
5 Soothability	**.466**	-.021	-.007	-.033	.012	**-.382**	.365
6 Hypersensiti	-.121	**.746**	.195	.017	-.011	.062	.613
7 Energy	**.650**	-.156	-.006	**.510**	.132	.047	.727
8 Adapt Change	**.587**	-.129	.005	-.038	.272	-.288	.519
9 Interest Tes	**.737**	-.130	.018	**.315**	.288	-.082	.748
10 Explor Objec	**.555**	-.186	.024	.194	**.440**	.066	.578
11 Orient Exami	**.764**	-.110	.003	.173	.190	**-.300**	.752
12 Gross-motor	.256	**-.483**	-.059	-.099	**.460**	.072	.529
13 Control Move	**.317**	**-.385**	-.025	-.084	**.513**	.070	.525
14 Hypotonicity	-.120	**.830**	.210	.010	-.059	.016	.751
15 Hypertonicit	-.079	**.868**	.221	.056	-.061	.021	.816
16 Tremulousnes	-.029	**.840**	.223	-.054	.024	-.052	.762
17 Slow Delayed	-.215	**.778**	.186	-.021	-.121	.021	.702
18 Frenetic Mov	-.046	**.859**	.225	.071	-.019	.040	.798
Trace	3.70	4.96	.30	.96	1.09	.61	11.63

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 2 columns represent the second order factors. The next 4 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 11

Schmid and Leiman (1957) Solution for *Standardization* (n=315) Sample for **Ages 6 to 12 Months**

Variable	I	II	III	A	B	C	D	E	F	h^2
1 Predom State	.128	.133	-.882	.056	.012	-.019	-.197	-.011	.016	.855
2 Labil arousa	-.057	-.169	.867	-.068	-.018	.046	.195	-.009	-.058	.832
3 Posit Affect	.665	.208	.077	-.023	-.060	.042	-.002	-.457	-.024	.706
4 Negat Affect	-.169	-.226	.155	-.008	-.095	.410	.020	-.085	.223	.339
5 Soothability	.483	.085	-.056	-.068	.043	-.068	-.027	-.303	-.088	.355
6 Hypersensiti	-.097	-.562	.132	-.030	.072	.382	.038	.079	-.051	.505
7 Energy	.547	.249	-.426	.374	.000	.082	-.052	.006	-.130	.709
8 Adapt Change	.233	.467	.057	.131	.065	-.371	.016	-.074	-.012	.440
9 Interest Tes	.409	.470	-.257	.404	-.009	-.037	-.027	-.029	.032	.621
10 Initiative	.468	.425	-.216	.482	-.056	.060	.000	.046	-.042	.690
11 Exploration	.523	.289	-.187	.381	-.050	.137	-.005	-.053	-.051	.564
12 Atten Tasks	.218	.608	-.063	.433	.015	-.221	.018	.075	.069	.668
13 Persistence	.368	.531	-.137	.453	.013	-.120	.007	.036	.016	.658
14 Enthusiasm	.537	.460	-.262	.429	-.007	-.044	-.018	-.019	-.064	.760
15 Fearfulness	-.649	-.045	.161	-.050	.035	.087	-.003	.020	.443	.658
16 Frus Inabili	-.091	-.356	.050	.054	-.066	.496	.014	-.002	.118	.406
17 Orient Exami	.584	.275	.024	.082	-.064	-.242	.041	-.023	-.374	.629
18 Soc Engageme	.622	.275	.141	-.011	-.026	-.024	.007	-.474	.031	.709
19 Cooperation	.377	.585	.104	.142	.040	-.426	.026	-.149	-.035	.723
20 Gross-motor	.169	.580	-.009	.022	-.486	-.016	.008	-.075	.010	.608
21 Fine-motor	.179	.664	.098	.157	-.378	-.095	.038	-.040	.047	.664
22 Control Move	.033	.653	-.008	.123	-.427	-.050	.009	-.010	.115	.641
23 Hypotonicity	-.251	-.306	.094	.007	.484	-.117	-.008	-.024	.184	.449
24 Hypertonicit	-.128	-.385	.131	.091	.485	.010	.014	-.012	.133	.444
25 Tremulousnes	.091	-.448	.106	.068	.386	.067	.028	.018	-.082	.386
26 Slow Delayed	-.347	-.412	.197	-.211	.348	-.137	.011	.009	.062	.517
27 Frenetic Mov	.068	-.637	.041	.040	.346	.336	.005	-.058	.010	.650
28 Hyperactivit	.249	-.548	.028	.118	.191	.488	.014	-.098	-.014	.662
Trace	3.85	5.24	2.15	1.43	1.50	1.45	.09	.60	.53	16.85

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 3 columns represent the second order factors. The next 6 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 12
Schmid and Leiman (1957) Solution for
Clinical (n=188) Sample for **Ages 6 to 12 Months**

Variable	I	II	III	A	B	C	D	E	F	h^2
1 Predom State	.119	**.761**	-.092	-.004	.157	.000	-.039	-.066	.349	.754
2 Labil arousa	-.182	.073	**.897**	.052	.000	-.026	-.085	.032	.029	.856
3 Posit Affect	.559	.201	.026	.001	.107	-.022	-.012	**.557**	-.053	.678
4 Negat Affect	**-.382**	**.365**	.044	.000	-.019	**-.492**	.066	.102	.034	.539
5 Soothability	.292	**-.327**	**-.307**	-.017	.160	.054	-.054	.114	-.168	.359
6 Hypersensiti	-.174	.002	**.886**	.051	-.013	-.033	-.089	.074	-.013	.832
7 Energy	**.624**	.254	-.035	.001	**.472**	-.009	-.017	.124	.059	.697
8 Adapt Change	**.501**	-.110	.010	.002	-.126	**.500**	-.047	.193	.016	.568
9 Interest Tes	**.634**	.108	-.016	.003	**.513**	.015	-.005	.044	.014	.680
10 Initiative	**.631**	.072	-.162	-.006	**.561**	-.047	.031	-.008	-.007	.747
11 Exploration	**.479**	.271	.030	.004	**.478**	-.152	-.028	.148	.031	.579
12 Atten Tasks	**.742**	-.127	-.013	.004	**.327**	**.341**	.080	-.095	.014	.806
13 Persistence	**.748**	-.017	-.170	-.005	**.458**	.116	.119	-.052	-.003	.829
14 Enthusiasm	**.726**	.066	-.024	.003	**.471**	.161	.014	-.001	.038	.782
15 Fearfulness	-.194	-.236	**.824**	.048	.078	-.038	-.056	-.105	-.085	.803
16 Frus Inabili	-.017	-.226	**.780**	.046	.070	.046	-.017	-.049	-.079	.678
17 Orient Exami	**.631**	.225	-.123	-.006	-.072	.218	.095	**.416**	.042	.700
18 Soc Engageme	**.580**	.194	.126	.008	.129	.015	.006	**.492**	-.035	.650
19 Cooperation	**.740**	-.149	-.088	-.001	.122	**.456**	.033	.085	-.002	.809
20 Gross-motor	**.651**	.217	-.057	.000	.007	-.065	**.588**	.055	.033	.827
21 Fine-motor	**.729**	-.073	-.085	-.001	.084	.090	**.518**	-.052	-.038	.831
22 Control Move	**.682**	.045	-.091	-.002	.064	-.032	**.544**	.036	-.032	.779
23 Hypotonicity	-.109	-.006	**.883**	.051	-.030	-.075	.049	.047	-.027	.806
24 Hypertonicit	.024	.143	**.832**	.050	-.029	-.021	.148	-.009	.058	.743
25 Tremulousnes	-.028	.055	**.937**	.055	-.003	.053	-.034	.055	.029	.893
26 Slow Delayed	-.066	-.136	**.822**	.048	-.133	.025	.129	.002	-.053	.739
27 Frenetic Mov	-.024	.093	**.922**	.054	.002	-.003	.040	.025	.036	.865
28 Hyperactivit	-.050	-.015	**.864**	.052	.071	.102	-.089	-.066	.036	.782
Trace	6.69	1.37	7.72	.03	1.73	.97	1.02	.89	.19	20.61

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 3 columns represent the second order factors. The next 6 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 13
Schmid and Leiman (1957) Solution for
Combined (n=503) Sample for **Ages 6 to 12 Months**

Variable	I	II	III	A	B	C	D	E	h^2
1 Predom State	.094	-.117	.179	-.011	.385	-.068	-.091	-.043	.218
2 Labil arousa	-.130	.869	-.036	.103	-.051	.012	-.002	.024	.788
3 Posit Affect	.096	-.003	.807	.004	.052	-.041	.006	.272	.739
4 Negat Affect	-.419	.126	.068	-.002	-.030	-.505	.116	.054	.469
5 Soothability	.086	-.221	.415	-.019	.013	.117	-.091	.140	.270
6 Hypersensiti	-.248	.825	-.036	.095	-.019	-.087	-.028	.021	.761
7 Energy	.345	-.073	.535	.001	.512	.007	-.059	.037	.678
8 Adapt Change	.525	-.075	.116	.007	-.030	.460	.013	.020	.507
9 Interest Tes	.451	-.042	.472	.004	.475	.038	.019	.017	.656
10 Initiative	.467	-.115	.472	-.006	.499	-.007	.047	.008	.706
11 Exploration	.271	.018	.560	.007	.451	-.105	.011	.066	.607
12 Atten Tasks	.717	-.054	.177	.008	.323	.305	.098	-.065	.759
13 Persistence	.634	-.142	.338	-.005	.411	.170	.080	-.027	.740
14 Enthusiasm	.540	-.070	.486	.004	.479	.129	.005	.016	.779
15 Fearfulness	-.144	.778	-.205	.090	-.020	-.038	.019	-.047	.681
16 Frus Inabili	-.132	.705	-.019	.079	.050	-.151	.060	-.002	.551
17 Orient Exami	.445	-.151	.410	-.007	-.001	.261	.066	.120	.475
18 Soc Engageme	.138	.064	.791	.012	.050	-.014	.022	.265	.723
19 Cooperation	.656	-.128	.286	.002	.064	.441	.056	.047	.732
20 Gross-motor	.626	-.035	.203	-.006	-.002	-.056	.472	.026	.661
21 Fine-motor	.746	-.047	.156	-.003	.028	.063	.453	-.005	.792
22 Control Move	.663	-.026	.145	-.004	.036	-.027	.463	-.007	.678
23 Hypotonicity	-.110	.847	-.060	.101	-.029	.040	-.021	.008	.746
24 Hypertonicit	.014	.833	-.047	.100	.015	.041	.044	-.007	.711
25 Tremulousnes	-.045	.905	.006	.110	.027	.073	-.028	.015	.841
26 Slow Delayed	-.087	.748	-.227	.090	-.172	.122	.007	-.017	.671
27 Frenetic Mov	-.110	.889	.002	.105	.043	-.018	-.012	.012	.815
28 Hyperactivit	-.127	.826	.043	.099	.114	-.026	-.060	.009	.727
Trace	4.50	6.98	3.37	.10	1.66	.97	.71	.20	18.48

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 3 columns represent the second order factors. The next 5 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 14
Schmid and Leiman (1957) Solution for
Standardization (n=939) Sample for **Ages 13 to 42 Months**

Variable	I	II	III	A	B	C	D	E	h^2
1 Posit Affect	.306	-.023	.611	-.004	.034	.111	.156	.014	.506
2 Negat Affect	-.669	-.076	.049	-.337	-.011	.001	-.068	.092	.583
3 Soothability	.565	.032	.105	.327	.025	.042	-.014	-.042	.443
4 Hypersensiti	-.666	.238	-.028	-.234	-.011	.001	-.099	-.124	.581
5 Energy	.104	-.170	.707	.044	-.027	.158	-.033	.030	.569
6 Adapt Change	.753	-.059	-.019	.228	.017	-.022	.206	.009	.667
7 Interest Tes	.541	-.144	.523	-.006	-.031	.067	.325	-.006	.698
8 Initiative	.469	-.196	.533	-.058	-.051	.064	.337	.005	.667
9 Exploration	.114	-.197	.706	-.077	-.052	.130	.120	.018	.591
10 Atten Tasks	.755	-.109	.146	.064	.006	-.020	.383	.027	.755
11 Persistence	.702	-.090	.275	.036	-.013	.006	.393	-.016	.733
12 Enthusiasm	.676	-.053	.485	.058	.001	.060	.346	-.033	.823
13 Fearfulness	-.245	065	-.576	-.161	-.003	-.141	.062	.005	.445
14 Frus Inabili	-.564	.154	.048	-.358	.022	-.014	.065	-.023	.478
15 Orient Exami	.672	.013	.399	.221	.011	.075	.170	-.066	.699
16 Soc Engageme	.294	-.087	.607	-.004	.084	.115	.100	.131	.509
17 Cooperation	.810	-.034	.184	.194	.016	.010	.283	-.023	.810
18 Gross-motor	.181	-.551	.135	-.037	.060	.018	-.026	.448	.561
19 Fine-motor	.251	-.611	.129	-.059	.016	.004	.057	.422	.638
20 Control Move	.183	-.672	.085	.042	-.075	.016	-.058	.333	.614
21 Hypotonicity	.066	.782	-.085	.032	.361	-.005	-.016	-.012	.756
22 Hypertonicit	-.002	.790	-.062	.013	.379	.003	-.049	.012	.774
23 Tremulousnes	.020	.565	-.032	-.045	.276	-.008	.037	.018	.401
24 Slow Delayed	-.073	.622	-.334	.015	.084	-.068	.055	-.282	.598
25 Frenetic Mov	-.475	.514	.155	-.173	.056	.037	-.020	-.240	.606
26 Hyperactivit	-.610	.275	.396	-.124	.025	.115	-.215	-.130	.697
Trace	6.24	3.66	3.52	.64	.39	.13	.93	.70	16.20

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 3 columns represent the second order factors. The next 5 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

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Table 15
Schmid and Leiman (1957) Solution for
Clinical (n=402) Sample for **Ages 13 to 42 Months**

Variable	I	II	III	A	B	C	D	h^2
1 Posit Affect	.647	-.277	-.107	-.036	.116	-.011	.355	.648
2 Negat Affect	-.378	-.310	-.029	-.029	-.361	.001	.189	.408
3 Soothability	.337	-.148	.255	-.052	.178	.011	-.008	.235
4 Hypersensiti	-.029	.777	-.204	.236	-.027	-.006	.064	.706
5 Energy	.401	-.215	.301	.018	-.072	.016	.382	.449
6 Adapt Change	.560	.178	.012	.003	.393	-.004	-.093	.508
7 Interest Tes	.764	-.161	.102	-.013	.217	.000	.293	.753
8 Initiative	.657	-.143	.487	.002	.165	.024	.242	.775
9 Exploration	.565	-.221	.189	.020	-.021	.008	.452	.609
10 Atten Tasks	.742	.070	.200	.009	.360	.006	.077	.731
11 Persistence	.719	-.011	.346	.005	.298	.015	.127	.742
12 Enthusiasm	.860	.008	.058	.016	.322	-.002	.235	.902
13 Fearfulness	-.070	.802	-.282	.215	.038	-.011	-.050	.777
14 Frus Inabili	-.043	.598	-.277	.195	-.080	-.011	.126	.496
15 Orient Exami	.778	.046	-.129	.001	.359	-.013	.137	.772
16 Soc Engageme	.619	-.337	-.106	-.035	.046	-.010	.427	.694
17 Cooperation	.792	.134	.069	.016	.412	-.002	.060	.823
18 Gross-motor	.030	-.064	.866	.019	-.054	.050	.010	.761
19 Fine-motor	.118	-.086	.876	.003	.011	.049	-.012	.792
20 Control Move	.124	-.178	.841	-.018	-.009	.047	.022	.758
21 Hypotonicity	-.067	.903	-.045	.256	.022	.004	-.045	.890
22 Hypertonicit	-.094	.869	.062	.248	.009	.010	-.060	.833
23 Tremulousnes	-.011	.892	-.158	.249	.052	-.003	-.030	.887
24 Slow Delayed	-.033	.878	.097	.248	.047	.011	-.068	.849
25 Frenetic Mov	.006	.873	-.087	.256	.022	.001	.016	.835
26 Hyperactivit	-.055	.701	-.171	.215	-.043	-.004	.059	.575
Trace	5.96	6.54	3.15	.51	1.05	.01	.99	18.21

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 3 columns represent the second order factors. The next 4 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 16
Schmid and Leiman (1957) Solution for
Combined (n=1041) Sample for **Ages 13 to 42 Months**

Variable	I	II	III	A	B	C	D	h^2
1 Posit Affect	.024	**.578**	**-.302**	-.019	-.034	-.104	-.183	.471
2 Negat Affect	.065	.100	**.686**	.071	-.054	.045	-.059	.499
3 Soothability	.224	.075	**-.485**	-.044	-.074	.024	.000	.299
4 Hypersensiti	**-.709**	.062	**.323**	.021	**.358**	-.045	-.019	.742
5 Energy	.159	**.689**	-.020	.009	.002	.094	-.193	.547
6 Adapt Change	.038	.017	**-.758**	-.075	.022	-.019	.030	.583
7 Interest Tes	.148	**.569**	**-.518**	-.041	-.008	.020	-.146	.636
8 Initiative	.290	**.612**	**-.416**	-.031	.005	.174	-.136	.682
9 Exploration	.141	**.752**	-.072	.005	.007	.075	-.213	.642
10 Atten Tasks	.127	.277	**-.738**	-.069	.033	.060	-.036	.648
11 Persistence	.189	**.390**	**-.662**	-.059	.020	.094	-.069	.644
12 Enthusiasm	.039	**.511**	**-.691**	-.060	.033	-.027	-.125	.761
13 Fearfulness	**-.690**	-.164	.094	-.005	**.358**	-.039	.062	.645
14 Frus Inabili	**-.593**	.124	**.358**	.028	.277	-.067	-.049	.579
15 Orient Exami	-.030	.331	**-.712**	-.064	-.003	-.133	-.090	.648
16 Soc Engageme	.096	**.615**	-.233	-.011	-.056	-.069	-.193	.487
17 Cooperation	.039	.240	**-.823**	-.078	.030	-.029	-.037	.746
18 Gross-motor	**.563**	.333	.044	.007	.034	**.527**	-.009	.709
19 Fine-motor	**.596**	**.338**	-.054	-.002	.019	**.521**	-.008	.743
20 Control Move	**.640**	.310	-.011	.004	-.036	**.483**	-.012	.741
21 Hypotonicity	**-.768**	.055	.025	-.012	**.463**	.030	.018	.809
22 Hypertonicit	**-.701**	.063	.052	-.009	**.454**	.078	.022	.711
23 Tremulousnes	**-.795**	.065	-.003	-.014	**.454**	-.010	.008	.843
24 Slow Delayed	**-.690**	-.016	.010	-.014	**.433**	.056	.043	.669
25 Frenetic Mov	**-.783**	.127	.144	.002	**.434**	-.019	-.021	.838
26 Hyperactivit	**-.664**	.214	**.335**	.026	**.324**	-.066	-.072	.714
Trace	5.93	3.57	4.90	.04	1.46	.90	.24	17.04

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 3 columns represent the second order factors. The next 4 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 17
Mean Factor Score Differences
Across Standardization and Clinical Samples
As Regards the Varimax-Rotated Product ($F_{VxF} x F_{FxS} = F_{VxS}$) Matrices

Age 1 to 5 Months

Factor	Standardization	Clinical	$\underline{F}$	$\underline{p}_{CALCULATED}$
I	-.03 (0.95)	+.07 (1.10)	1.19	.2753
II	-.26 (0.57)	+.58 (1.42)	99.16	<.0001

Age 6 to 12 Months

Factor	Standardization	Clinical	$\underline{F}$	$\underline{p}_{CALCULATED}$
I	+.02 (0.88)	-.04 (1.17)	<1.00	.5304
II	-.32 (0.28)	+.55 (1.44)	108.89	<.0001
III	-.02 (0.98)	+.03 (1.02)	<1.00	.6101

Age 13 to 42 Months

Factor	Standardization	Clinical	$\underline{F}$	$\underline{p}_{CALCULATED}$
I	+.32 (0.54)	-.51 (1.31)	203.11	<.0001
II	-.02 (0.95)	+.03 (1.08)	<1.00	.5009
III	-.02 (1.00)	+.04 (1.00)	<1.00	.3630